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(54) **IMAGE FORMING APPARATUS HAVING IMAGE FORMING UNIT**

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USPC 399/91
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(57) **ABSTRACT**

An image forming apparatus includes a casing, a cover unit, and a liquid channel. The cover unit is disposed above an image forming unit. The cover unit includes a first member, a second member, and a neighboring portion positioned between the first member and the second member. The liquid channel is configured to guide liquid and includes a first channel and a second channel. The first channel is disposed between the neighboring portion and the image forming unit. The first channel includes a recess part and a liquid outlet. The recess part is disposed below the neighboring portion and extending toward the frame in an extending direction. The liquid outlet is positioned at an end portion of the recess part in the extending direction. The second channel is disposed at the frame. The second channel is configured to allow liquid to pass through the frame in the extending direction.

20 Claims, 8 Drawing Sheets

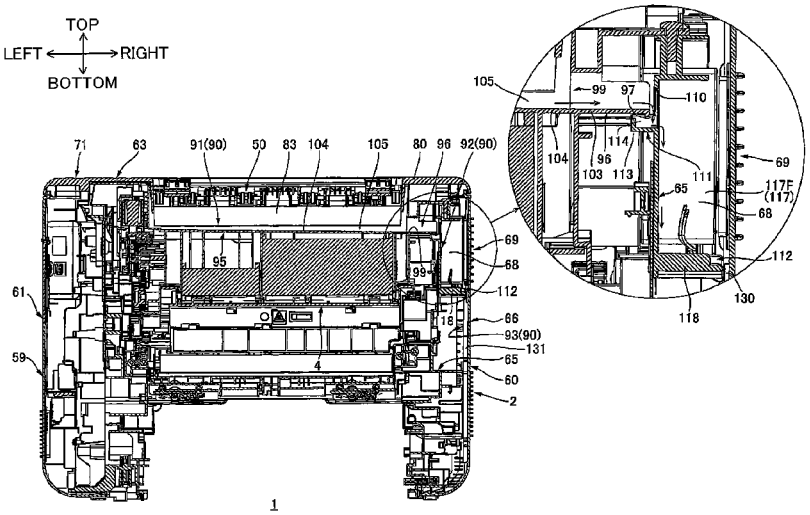

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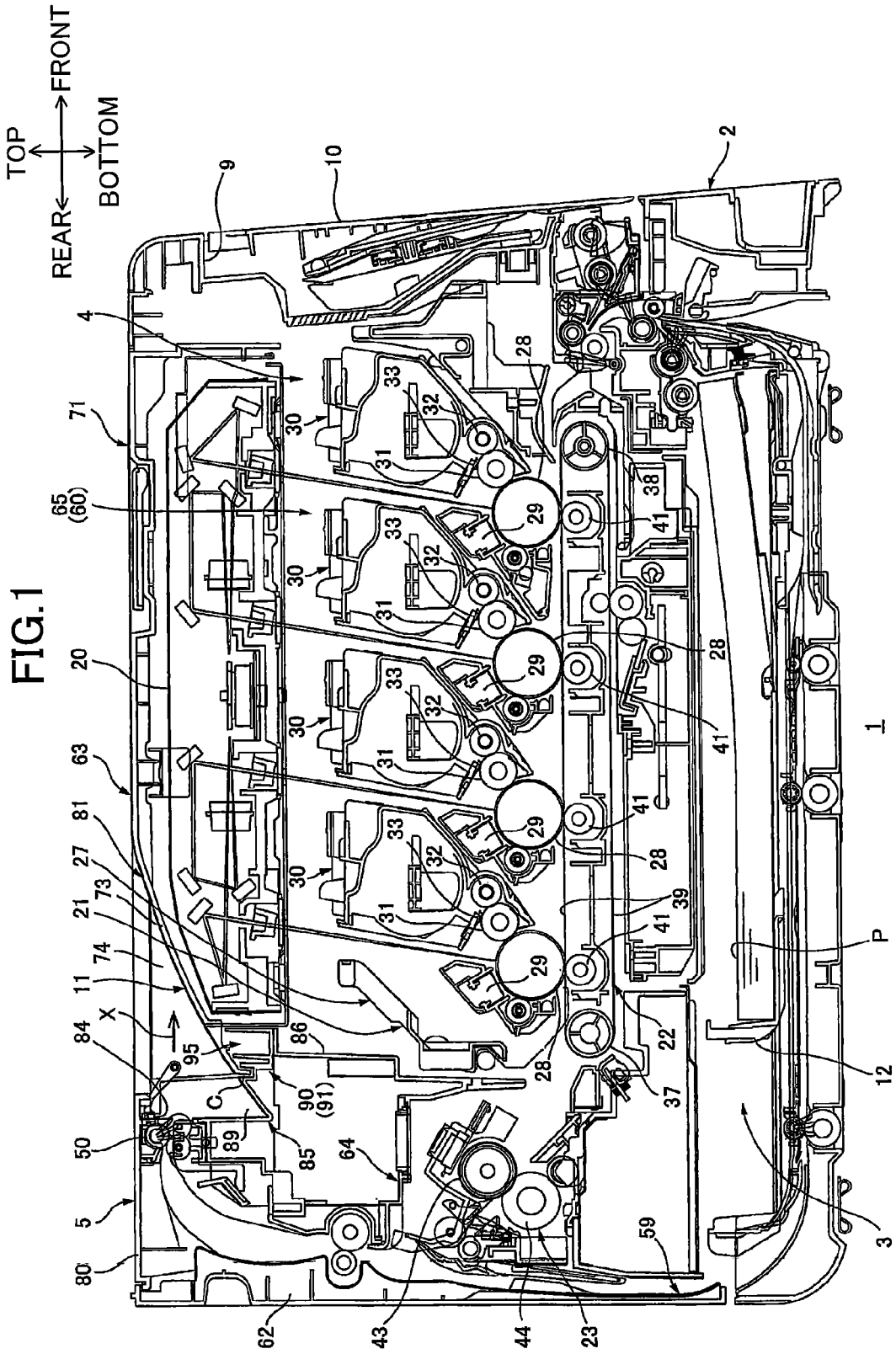
FIG.1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59
62
63
64
65
(60)
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(91)
95
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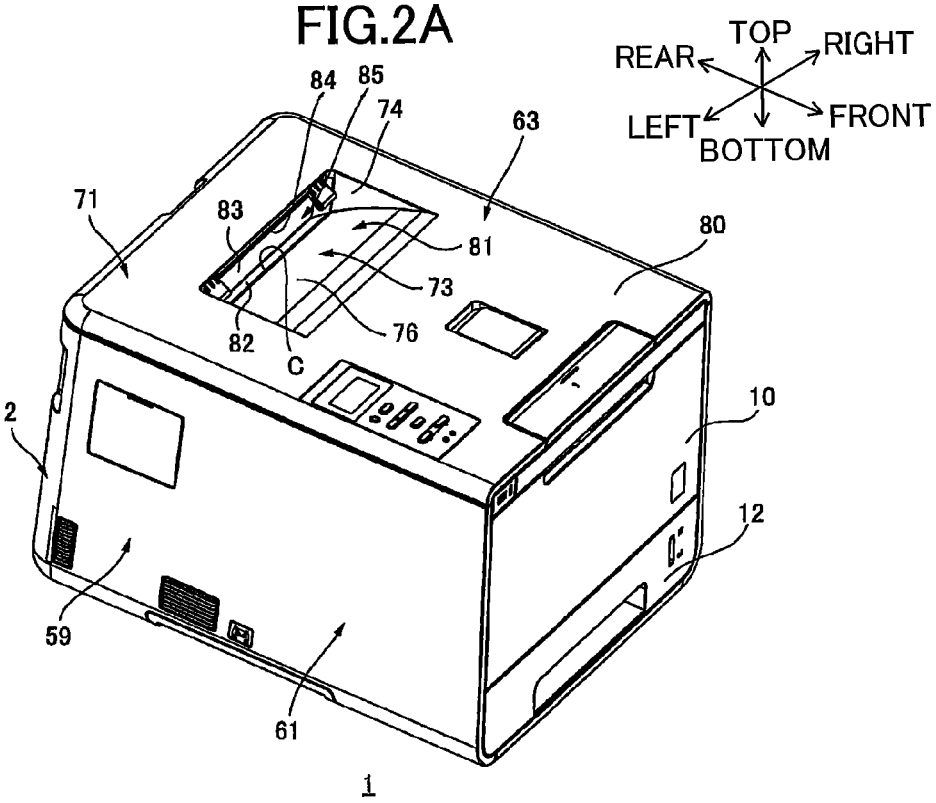
P
X

FIG.2A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59
61
1

FIG.2B

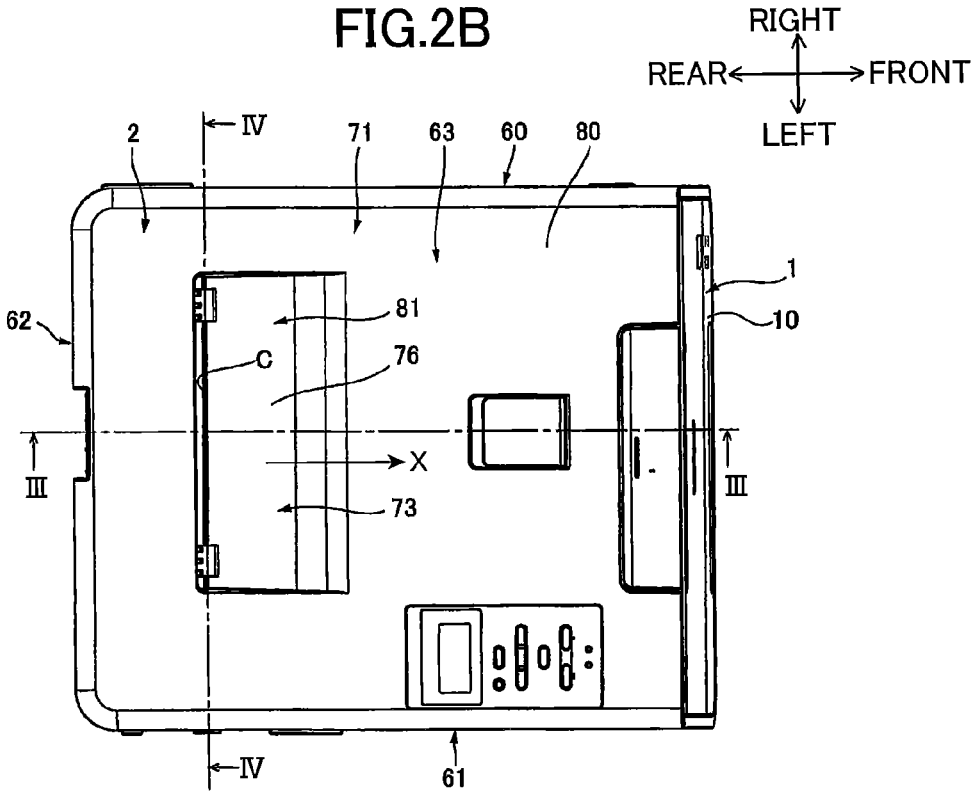
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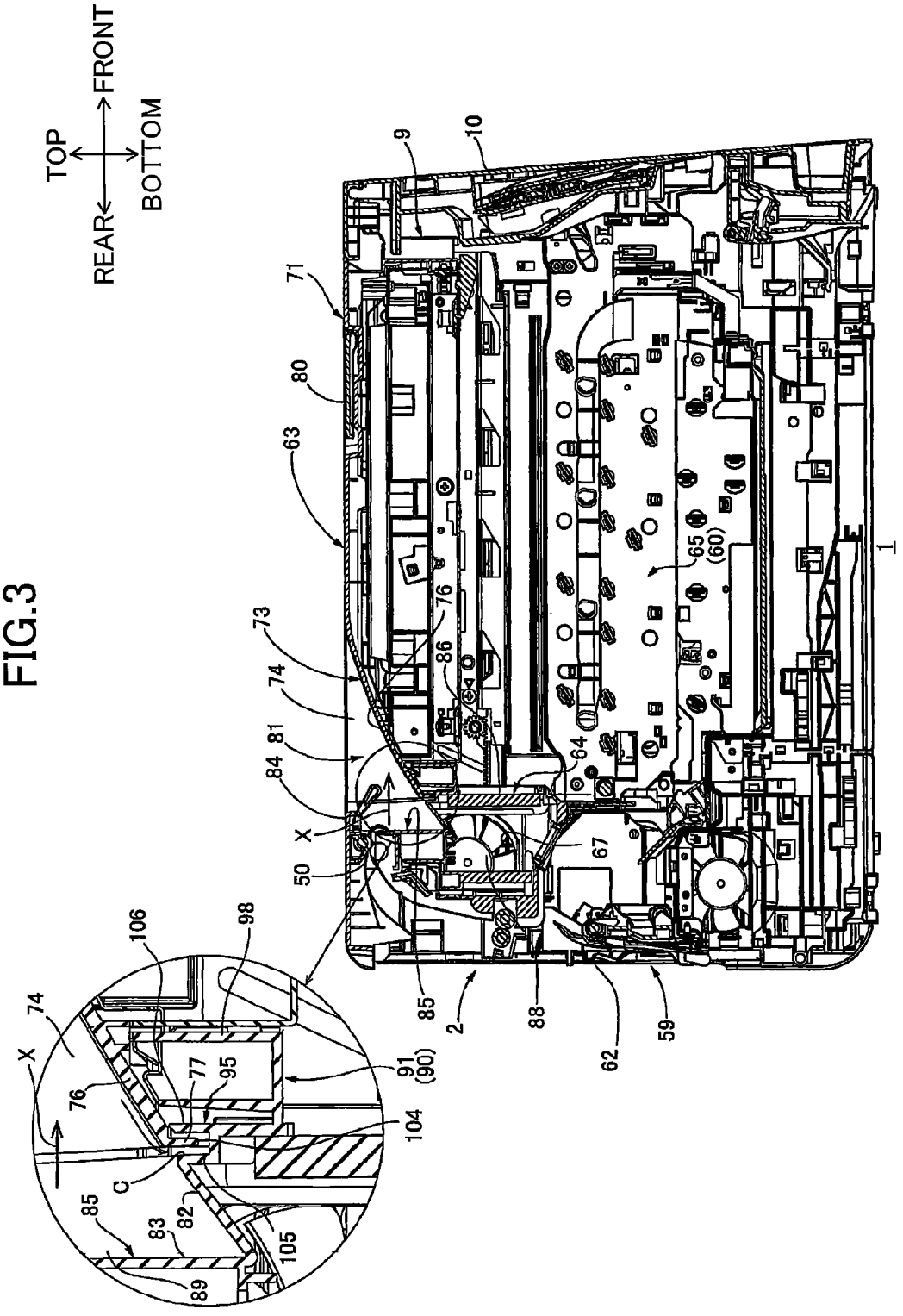
FIG.3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95
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C
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83
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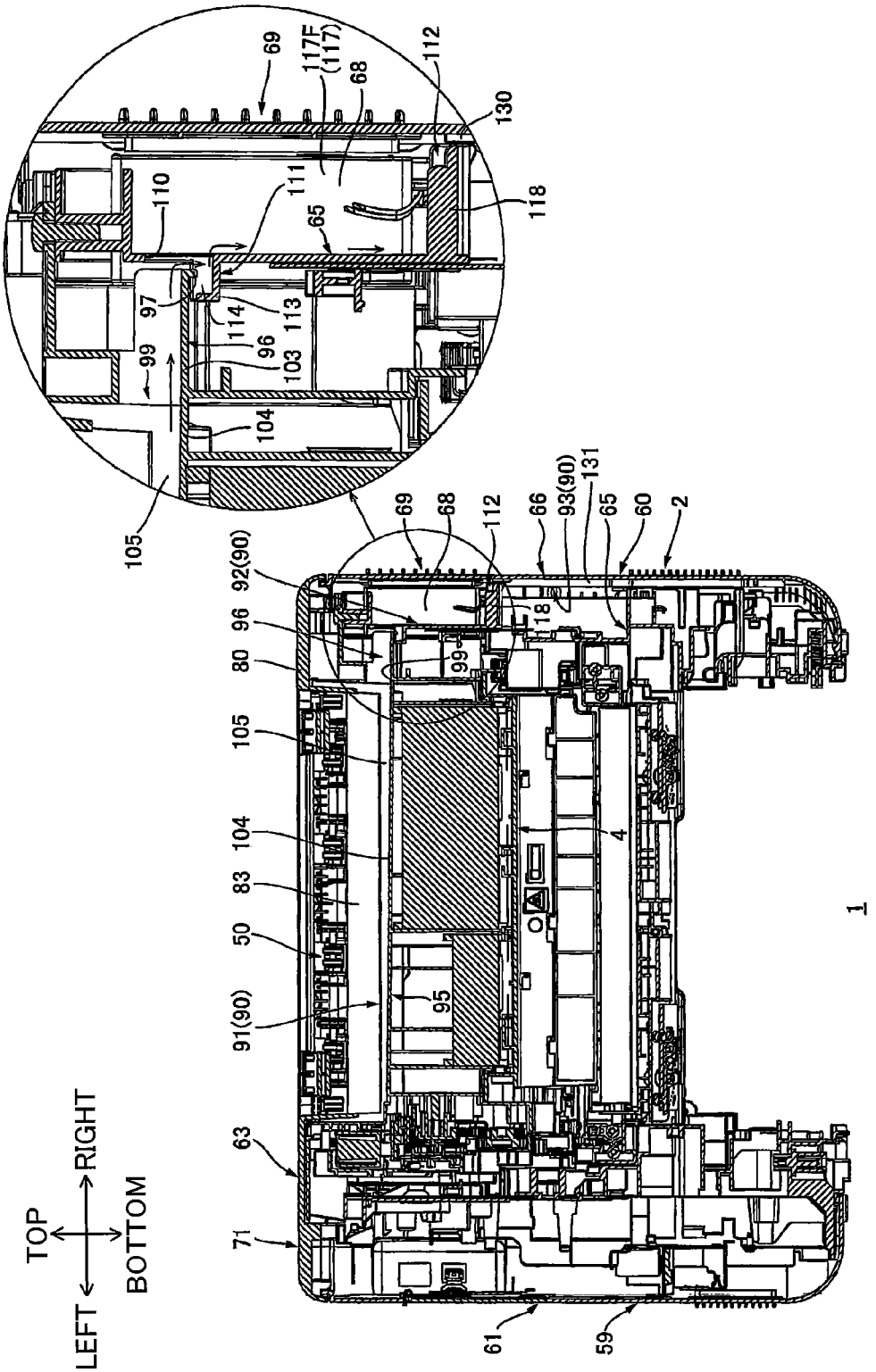
89
106
98

FIG.4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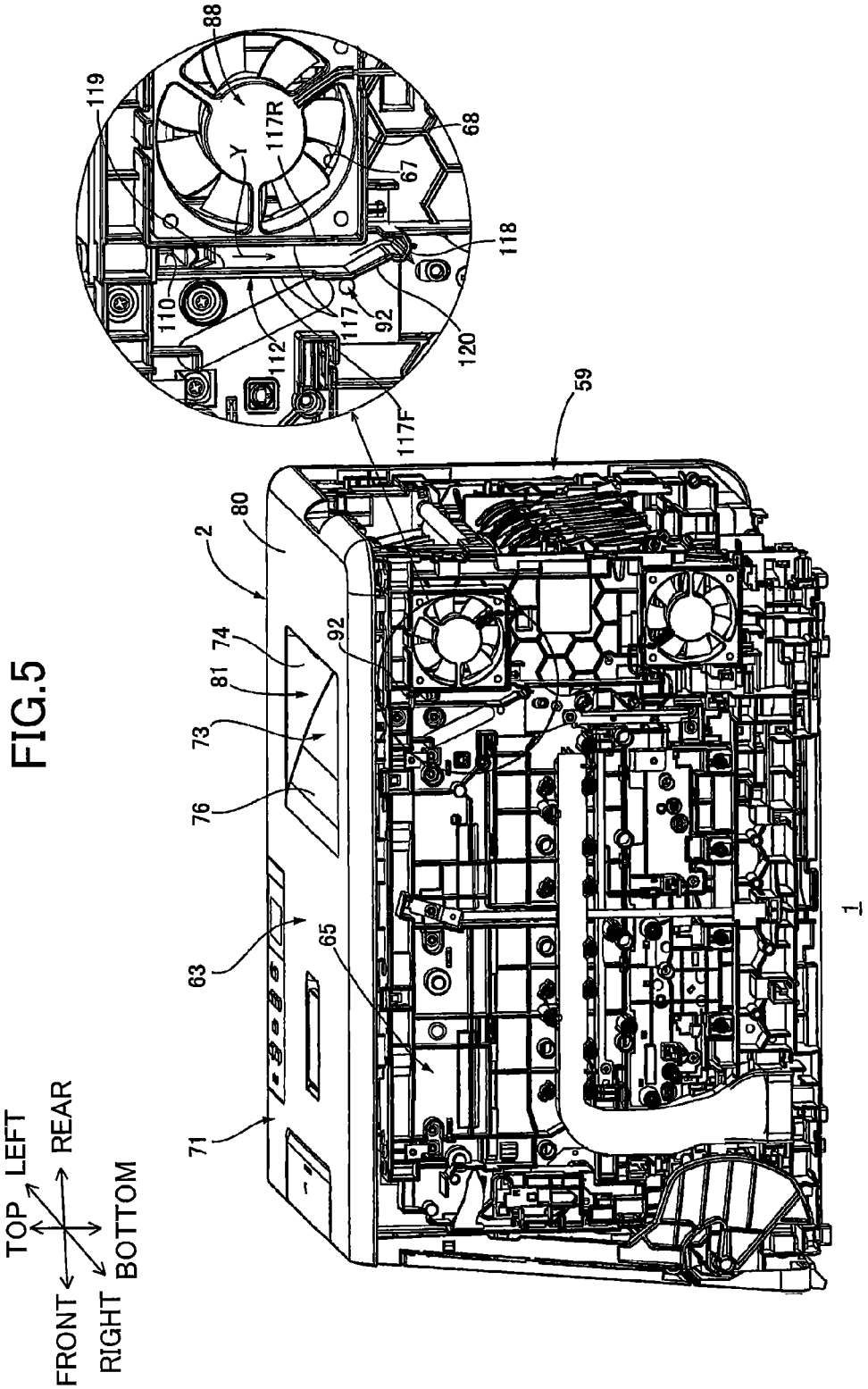
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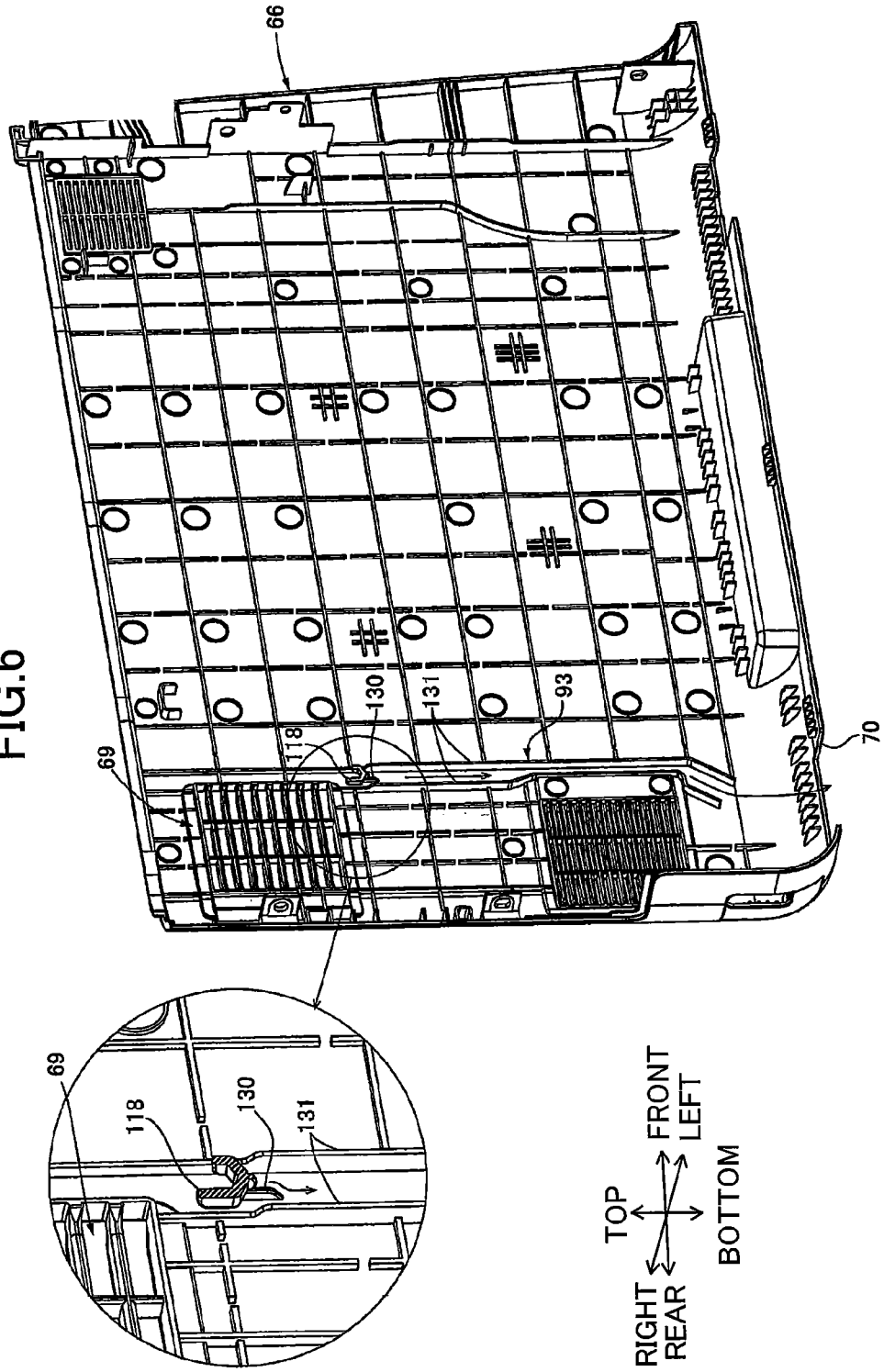
FIG.5

FIG.6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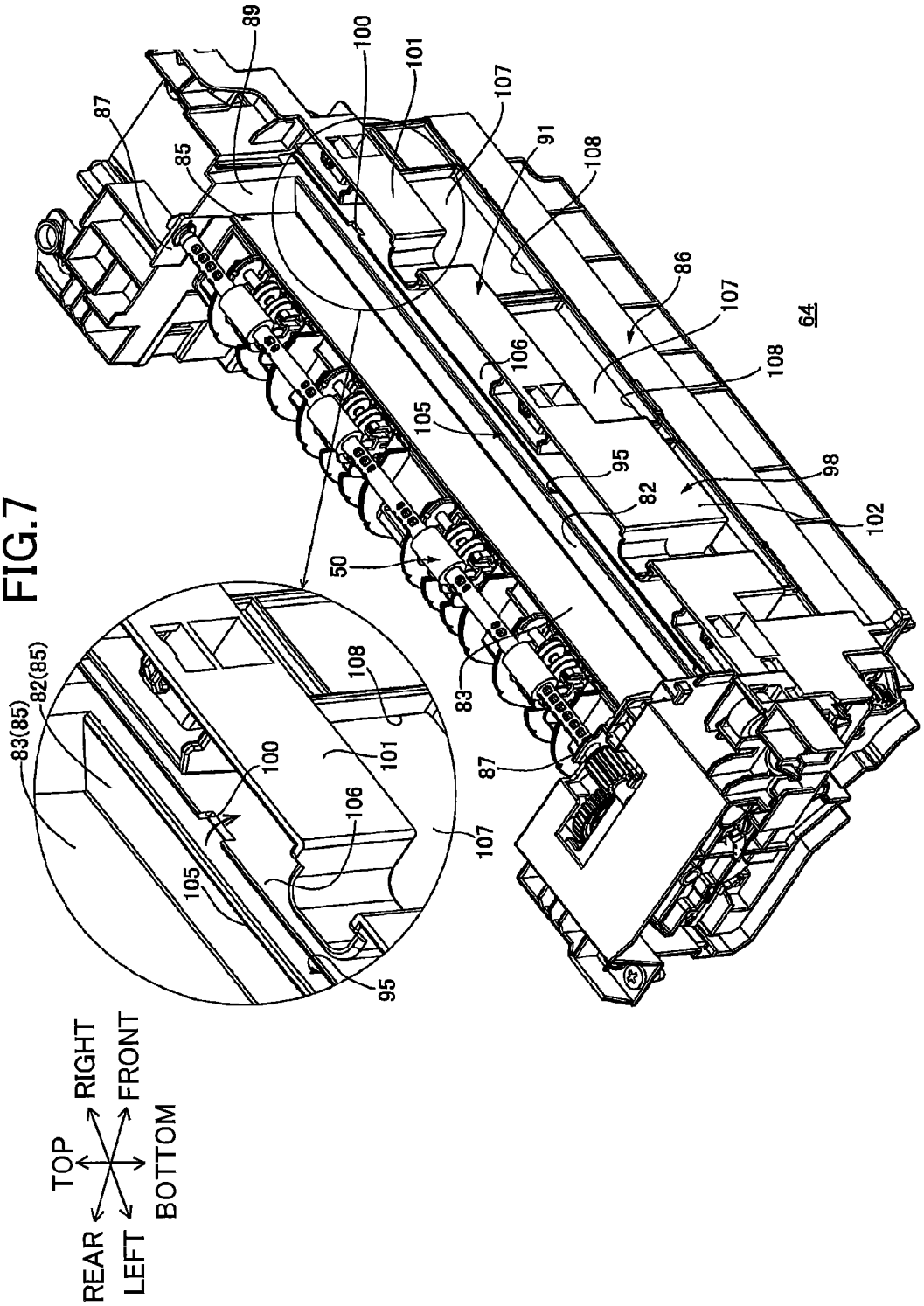
RIGHT
REAR

FIG.7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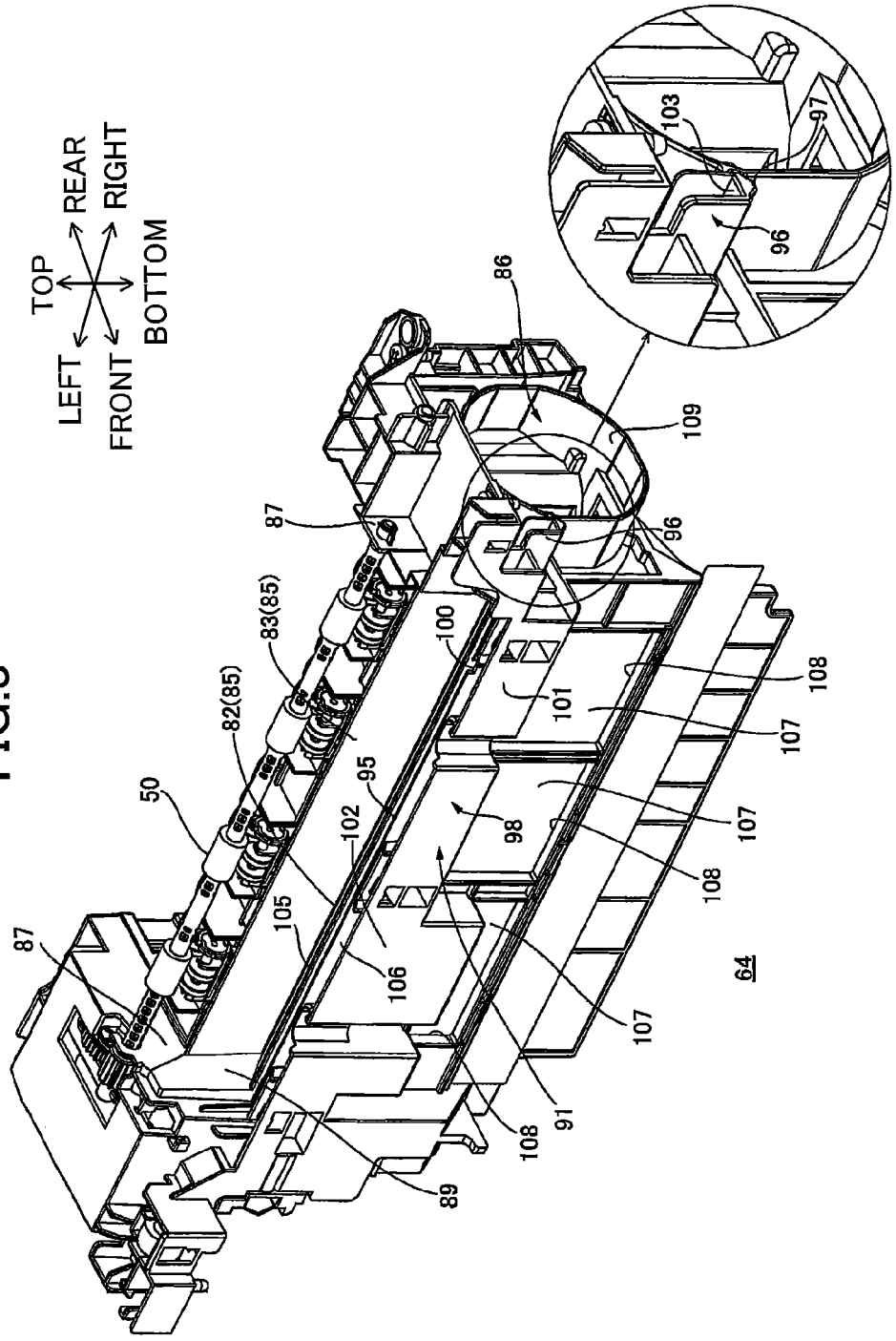
83(85)
82(85)
108
100
101
106
105
95
TOP
RIGHT
FRONT
REAR
LEFT
BOTTOM

FIG.8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101
108
107
95
102
98
105
106
91
89
64

IMAGE FORMING APPARATUS HAVING IMAGE FORMING UNIT

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority from Japanese Patent Application No. 2013-227603 filed Oct. 31, 2013 and Japanese Patent Application No. 2013-227604 filed Oct. 31, 2013. The entire contents of these priority applications are incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to an image-forming apparatus employing an electrophotographic system.

BACKGROUND

One electrophotographic image-forming apparatus disclosed in Japanese unexamined patent application publication No. 2006-53508 is a laser printer. The laser printer includes a body case having a cover portion for covering a top portion of the body case; a process cartridge that form toner image on recording paper and disposed in the body case; and a fixing unit that fixes the toner image formed on the recording paper.

SUMMARY

However, if the user of the laser printer having the above construction accidentally spills liquid onto the cover portion of the laser printer, the liquid may penetrate and flow into the body case through seams or junctures therein.

If a liquid penetrates the body case of the laser printer, the process cartridges, the fixing unit, and the like may become wet, resulting in malfunctions such as electrical short-circuits.

In view of the foregoing, it is an object of the present invention to provide an image forming apparatus capable of preventing an image-forming unit and the like in the image forming apparatus from becoming wet when liquid is spilled on the cover portion of the body case.

In order to attain the above and other objects, the invention provides an image forming apparatus that may include a casing, a cover unit, and a liquid channel. The casing may include a frame supporting an image forming unit configured to form an image on a recording medium. The cover unit may be disposed above the image forming unit and include a first member, a second member positioned adjacent thereto, and a neighboring portion positioned between the first member and the second member and over the image forming unit. The liquid channel may be configured to guide liquid that has entered the casing. The liquid channel may include a first channel and a second channel. The first channel may be disposed between the neighboring portion and the image forming unit and configured to receive liquid that has entered the casing through the neighboring portion and guide liquid to the frame. The first channel may include a recess part and a liquid outlet. The recess part may be disposed below the neighboring portion and extends toward the frame in an extending direction. The liquid outlet may be configured to discharge liquid from the recess part and positioned at an end portion of the recess part in the extending direction. The second channel may be disposed at the frame and configured to receive liquid from the first channel. The second channel may have a passage opening through the frame in the extending direction and configured to allow liquid discharged from the liquid outlet to pass through the frame in the extending direction.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** is a central cross-sectional view of a printer as an example of an image forming apparatus according to an embodiment of the present invention;

FIG. **2**A is a perspective view of the printer shown in FIG. **1** as viewed from upper left according to the embodiment of the present invention;

FIG. **2**B is a plan view of the printer shown in FIG. **2**A according to the embodiment of the present invention;

FIG. **3** is a cross-sectional view taken along the line III-III of FIG. **2**B according to the embodiment of the present invention;

FIG. **4** is a cross-sectional view taken along the line IV-IV of FIG. **2**B according to the embodiment of the present invention;

FIG. **5** is a perspective view of the printer without a side cover as viewed from rear right according to the embodiment of the present invention;

FIG. **6** is a perspective view of the side cover shown in FIG. **4** as viewed from rear left according to the embodiment of the present invention;

FIG. **7** is a perspective view of a duct unit shown in FIG. **3** as viewed from front left according to the embodiment of the present invention; and

FIG. **8** is a perspective view of the duct unit shown in FIG. **3** as viewed from front right according to the embodiment of the present invention.

DETAILED DESCRIPTION

1. Overall Structure of a Printer

FIG. **1** shows a printer **1** that is an example of the image-forming apparatus of the present invention. In the preferred embodiment, the printer **1** is a direct tandem color laser printer. The printer **1** includes a main casing **2**, a sheet-feeding unit **3**, an image-forming unit **4**, and a sheet-discharge unit **5**. The sheet-discharge unit **5** is an example of the discharge unit of the present invention.

The main casing **2** has a box-like shape and accommodates therein the sheet-feeding unit **3**, the image-forming unit **4**, and the sheet-discharge unit **5**.

Directions in the following description related to the printer **1** will assume that the printer **1** is placed right side up on a level surface. Hence, the upper side of the printer **1** in FIG. **1** will be called the "top," and the lower side will be called the "bottom." Further, the right side of the printer **1** in FIG. **1** will be called the "front," and the left side will be called the "rear." Left and right sides of the printer **1** will be based on the perspective of a user facing the front of the printer **1**. Therefore, the near side of the printer **1** in FIG. **1** will be called the "left side," and the far side will be called the "right side." The directions are indicated by arrows in each drawing. Further, the left-right direction is an example of the extending direction of the present invention. Further, the direction from the rear side toward the front side is an example of the discharge direction X of the present invention for discharging recording media.

The main casing **2** includes an access opening **9**, a front cover **10**, and a discharge tray **11** as an example of the tray unit of the present invention. The access opening **9** is provided on

the front side of the main casing **2** and penetrates the front wall of the main casing **2** in the front-rear direction. The front cover **10** is pivotally movable about its bottom end portion in order to expose or cover the access opening **9**. The discharge tray **11** is provided on the rear portion of a top wall **71** (described later) constituting the main casing **2**. The discharge tray **11** is depressed downward from the top surface of the main casing **2** and functions to support sheets P of paper. The sheets P of paper are an example of the recording medium of the present invention.

The sheet-feeding unit **3** is adapted to convey the sheets P toward the image-forming unit **4**. The sheet-feeding unit **3** includes a paper tray **12** detachably mounted in the bottom section of the main casing **2** and serves to accommodate therein the sheets P.

The image-forming unit **4** is configured to form images on the sheets P. The image-forming unit **4** includes a scanning unit **20**, a process unit **21**, a transfer unit **22**, and a fixing unit **23**.

The scanning unit **20** is disposed on the top portion of the main casing **2**. The scanning unit **20** emits a laser beam for each of a plurality of photosensitive drums **28** (described later) based on image data in order to expose the photosensitive drums **28**.

The process unit **21** is disposed beneath the scanning unit **20** in the approximate vertical center region of the main casing **2**. The process unit **21** is capable of sliding along the front-rear direction and can be pulled out of the main casing **2** through the access opening **9**. The process unit **21** includes a drawer unit **27**, and developer cartridges **30**.

The drawer unit **27** includes a plurality of photosensitive drums **28**, and a plurality of scorotron chargers **29**.

A plurality of the photosensitive drums **28** is provided to correspond to the plurality of colors of toner used by the printer **1**. The photosensitive drums **28** are arranged parallel to each other and are spaced at regular intervals in the front-rear direction. More specifically, four photosensitive drums **28** are provided in the preferred embodiment to correspond to the four toner colors yellow, magenta, cyan, and black. The photosensitive drums **28** are arranged in this order from the front side of the drawer unit **27** toward the rear side thereof. Each photosensitive drum **28** has a general cylindrical shape and is elongated in the left-right direction. The photosensitive drums **28** are rotatably supported in the bottom of the drawer unit **27**, with their bottom surfaces exposed from the bottom portion of the drawer unit **27**.

A plurality of the scorotron chargers **29**, and specifically four scorotron chargers **29** in the preferred embodiment, are provided to respectively correspond with the plurality of photosensitive drums **28**. The scorotron chargers **29** are arranged at regular intervals so as to be positioned on the upper rear sides of corresponding photosensitive drums **28** with a gap therebetween.

A plurality of the developer cartridges **30**, and specifically four of the developer cartridges **30** in the preferred embodiment, is provided to respectively correspond with the plurality of photosensitive drums **28**. The developer cartridges **30** are detachably mounted in the drawer unit **27** on the upper sides of the corresponding photosensitive drums **28**. Each developer cartridge **30** includes a developing roller **31**, a supply roller **32**, and a thickness-regulating blade **33**.

The developing roller **31** is disposed in the bottom section of the corresponding developer cartridge **30**. The developing roller **31** has a lower rear portion exposed through the developer cartridge **30** and contacts the upper front portion of the corresponding photosensitive drum **28**. The supply roller **32** is disposed on the upper front side of the developing roller **31**. The supply roller **32** has a lower rear surface in rolling contact with the upper front surface of the developing roller **31**. The thickness-regulating blade **33** is disposed above the developing roller **31** and in sliding contact with the top surface of the developing roller **31**. Each developer cartridge **30** accommodates therein toner for the corresponding color in a space above the supply roller **32**.

The transfer unit **22** is disposed vertically between the paper tray **12** and the process unit **21** and is elongated in the front-rear direction. The transfer unit **22** includes a drive roller **37**, a follow roller **38**, a conveying belt **39**, and transfer rollers **41**. The drive roller **37** and the follow roller **38** are arranged parallel to each other and are spaced apart from each other in the front-rear direction. The conveying belt **39** is looped around the drive roller **37** and the follow roller **38**. A plurality of the transfer rollers **41**, and specifically four of the transfer rollers **41** in the preferred embodiment, is provided to correspond with the plurality of photosensitive drums **28**. The transfer rollers **41** are disposed beneath the corresponding photosensitive drums **28** such that the upper portion of the conveying belt **39** is interposed between the transfer rollers **41** and the corresponding photosensitive drums **28**.

The fixing unit **23** is positioned on the rear side of the transfer unit **22** with a gap therebetween. The fixing unit **23** includes a heating roller **43**, and a pressure roller **44**. The pressure roller **44** has an upper front surface in rolling contact with the lower rear surface of the heating roller **43** with pressure.

The sheet-discharge unit **5** is configured to discharge a sheet P from the main casing **2** after the image-forming unit **4** has formed an image on the sheet P. The sheet-discharge unit **5** is disposed above the fixing unit **23** and is provided with a discharge roller **50**.

The discharge roller **50** is disposed rearward of the discharge tray **11** and is rotatably supported on the main casing **2**.

The printer **1** having this construction performs an image-forming operation under the control of a control unit (not shown). At the beginning of the image-forming operation, the scorotron chargers **29** apply a uniform charge to the surfaces of the corresponding photosensitive drums **28**. Next, the scanning unit **20** exposes the circumferential surfaces of the charged photosensitive drums **28** based on prescribed image data, thereby forming electrostatic latent images on the circumferential surfaces of each of the photosensitive drums **28** based on the image data.

Toner in each of the developer cartridges **30** is supplied to the corresponding supply rollers **32**, and the supply rollers **32** in turn supply toner to the corresponding developing rollers **31**. This toner is positively tribocharged between the supply rollers **32** and the developing rollers **31**. Next, the thickness-regulating blades **33** regulate the toner carried on the surfaces of the corresponding developing rollers **31** at a uniform thickness. By rotating, the developing rollers **31** supply toner from their surfaces to the electrostatic latent images formed on the circumferential surfaces of the corresponding photosensitive drums **28**, producing toner images on the circumferential surfaces of the photosensitive drums **28**.

In the meantime, various rollers in the printer **1** rotate to feed sheets P from the paper tray **12** and to supply the sheets P one at a time onto the top portion of the conveying belt **39** at a prescribed timing. Subsequently, the conveying belt **39** conveys the sheet P supplied onto its top surface rearward so that the sheet P passes between each of the photosensitive drums **28** and the conveying belt **39**. At this time, the photosensitive drums **28** and corresponding transfer rollers **41**

sequentially transfer toner images in each color onto the sheet P conveyed therebetween, forming a color image on the sheet P.

After the color image has been formed on the sheet P, the circulation of the conveying belt **39** continues to convey the sheet P to a position between the heating roller **43** and the pressure roller **44**. As the sheet P passes between the heating roller **43** and the pressure roller **44**, the heating roller **43** and the pressure roller **44** apply heat and pressure to the sheet P to thermally fix the color image to the sheet P. Subsequently, the discharge roller **50** discharges the sheet P through a discharge opening **84** (described later) and onto the discharge tray **11** in a discharge direction X. Sheets P discharged from the main casing **2** are stacked on the top surface of a sheet support part **73** (described later) of the discharge tray **11** and supported thereby.

2. Detailed Description of the Main Casing

As shown in FIGS. **1**, **2**A, and **2**B, the main casing **2** includes a main casing body **59** as an example of the casing of the present invention, and a top cover **63**.

The main casing body **59** has a box-like shape with an opening upward. The main casing body **59** includes a right wall **60**, a left wall **61**, and a rear wall **62**.

As shown in FIG. **1**, the right wall **60** is disposed to the right of the image-forming unit **4** and constitutes the right side of the main casing body **59**. The right wall **60** has a general rectangular shape in a side view and is elongated in the front-rear direction.

As shown in FIG. **4**, the right wall **60** includes a frame **65**, and a side cover **66** as an example of the cover of the present invention.

The frame **65** is disposed on the right side of the image-forming unit **4** and constitutes the left portion of the right wall **60**. The frame **65** is formed of a resin material known in the art and has a plate shape that is generally rectangular in a side view and elongated in the front-rear direction, as illustrated in FIGS. **3** and **5**. The frame **65** is formed with a through-hole **67** and has a fan support part **68**.

As shown in FIG. **3**, the through-hole **67** is formed at the upper portion of the frame **65** near the rear end portion thereof at a position corresponding to a fan **88** (described later). The through-hole **67** has a general circular shape in a side view and penetrates the frame **65** in the left-right direction.

As shown in FIG. **5**, the fan support part **68** is disposed on the right surface of the frame **65** so as to surround the through-hole **67**. The fan support part **68** has a general squared cylindrical shape that extends in the left-right direction so as to protrude rightward from the right surface of the frame **65**. The front wall of the fan support part **68** constitutes a first guiding wall **117** described later.

As will be described later, the frame **65** is also integrally provided with a second channel **92**.

As shown in FIG. **4**, the side cover **66** constitutes the right side wall **60** and is disposed adjacent to the frame **65**. The side cover **66** covers the right side of the frame **65** from rightward, i.e. from opposite side of the image-forming unit with respect to the frame **65**. The side cover **66** is formed of a well-known resin material and is plate-shaped with a size and shape in a side view substantially the same as the frame **65**.

As shown in FIG. **6**, the side cover **66** has a bottom end portion curved leftward toward the bottom edge so as to cover the bottom end portion of the frame **65**.

As shown in FIGS. **4** through **6**, the side cover **66** is formed with a vent **69**, and a notched groove **70**. The vent **69** is provided in the upper portion of the side cover **66** near the rear edge thereof so as to confront the through-hole **67** in the left-right direction with a gap therebetween. The vent **69** is configured of a plurality of openings in a grid manner.

As will be described later, the top cover **63** is further integrally provided with a third channel **93**.

As shown in FIG. **4**, the left wall **61** constitutes the left side of the main casing body **59** and is disposed on the left side of the image-forming unit **4** so that the image-forming unit **4** is interposed between the right wall **60** and the left wall **61** in the left-right direction. As shown in FIG. **2**A, the left wall **61** has a general rectangular shape in a side view and is elongated in the front-rear direction.

As shown in FIG. **1**, the rear wall **62** is disposed on the rear side of the image-forming unit **4** and constitutes the rear side of the main casing **2**. The rear wall **62** connects the rear edges of the right wall **60** and the left wall **61** in the left-right direction.

As shown in FIG. **2**A, the front cover **10** is disposed between the upper portion on the front edge of the right wall **60** and the upper portion on the front edge of the left wall **61**.

As shown in FIGS. **1**, **2**A, and **2**B, the top cover **63** is disposed in the top portion of the main casing **2** at a position above the image-forming unit **4**.

As shown in FIGS. **2**A and **2**B, the top cover **63** is integrally provided with a flat plate part **80**, and a first tray part **81** serving as an example of the first member of the present invention.

The flat plate part **80** has a plate shape and is generally rectangular in a plan view.

The first tray part **81** is disposed in the rear portion of the flat plate part **80** at the approximate left-right center thereof and is recessed lower than the top surface of the flat plate part **80**.

The first tray part **81** includes a sheet support part **73**, and a pair of first tray side walls **74**.

As shown in FIG. **2**B, the sheet support part **73** constitutes the bottom portion of the first tray part **81**. The sheet support part **73** has a plate shape that is generally rectangular in a plan view and elongated in the left-right direction. As shown in FIG. **3**, the sheet support part **73** is integrally provided with a main portion **76**, and a protruding portion **77**.

The main portion **76** extends continuously from the flat plate part **80** slanted downward toward the rear. The protruding portion **77** is formed continuously with the rear edge of the main portion **76**, protruding downward therefrom. The protruding portion **77** extends across the entire left-right dimension of the main portion **76**.

As shown in FIG. **2**A, the first tray side walls **74** vertically couple the left and right edges of the main portion **76** with the bottom surface of the flat plate part **80**. With this arrangement, the first tray side walls **74** are aligned with but spaced apart from each other in the left-right direction. The first tray side walls **74** have a plate shape that is generally triangular in a side view, with the apex of the triangle oriented forward.

As shown in FIGS. **2**A and **3**, the top cover **63** is fixed to the top end portion of the main casing body **59** so as to cover the top portions of the right wall **60**, the left wall **61**, and the rear wall **62**. Note that the top cover **63** can be removed from the main casing body **59** in order to perform maintenance on the image-forming unit **4** and the like.

3. Duct Unit and Fan

As shown in FIG. **3**, the printer **1** further includes a duct unit **64**, and a fan **88**.

As shown in FIG. **1**, the duct unit **64** is disposed inside the main casing **2** at a position above and forward of the fixing unit **23** and above and rearward of the process unit **21**.

As shown in FIGS. **7** and **8**, the duct unit **64** is integrally provided with a duct body **86** as an example of the duct in the present invention, ozone filters **107**, a second tray part **85** as an example of the second member of the invention, and a pair of roller support parts **87**. The top cover **63**, the first tray part **81**, the second tray part **85**, and the top wall **71** are as an example of the cover unit of the present invention.

The duct body **86** has a box-like shape and is elongated in the left-right direction. The duct body **86** is formed with filter openings **108**, and a fan opening **109**.

As shown in FIG. **7**, a plurality of the filter openings **108**, and specifically three of the filter openings **108** in the preferred embodiment, is formed in the front wall of the duct body **86** arranged at intervals in the left-right direction. The filter openings **108** have a general rectangular shape in a front view and penetrate the front wall of the duct body **86** in the front-rear direction.

As shown in FIG. **8**, the fan opening **109** is formed in the right wall of the duct body **86**. The fan opening **109** has a general circular shape in a side view and penetrates the right wall of the duct body **86** in the left-right direction.

The ozone filters **107** is adapted to allow the passage of air, but trap volatile organic compounds (VOCs) contained in air passing therethrough and decompose/remove ozone. Three of the ozone filters **107** are provided to correspond to the three filter openings **108**.

The ozone filters **107** are plate-shaped and generally rectangular in a front view. The ozone filters **107** are disposed on the inner front side of the duct body **86** at positions rearward of the corresponding filter openings **108**. Through this arrangement, the front surfaces of the ozone filters **107** are exposed to the outside of the duct body **86** through the corresponding filter openings **108**.

As shown in FIG. **3**, the second tray part **85** is disposed immediately above and forward of the duct body **86**. The second tray part **85** has a vertical part **83**, a sloped part **82**, and a pair of second tray side walls **89**.

As shown in FIG. **7**, the vertical part **83** has a plate shape that is generally rectangular in a front view and elongated in the left-right direction. As shown in FIG. **3**, the vertical part **83** extends upward from the front end portion on the top surface of the duct body **86**.

The sloped part **82** extends continuously from the bottom end portion of the vertical part **83** so as to slope upward toward the front.

As shown in FIGS. **7** and **8**, the second tray side walls **89** have a plate shape that is generally rectangular in a side view and elongated vertically. The second tray side walls **89** extend upward from the respective left and right end portions on the top surface of the sloped part **82**. The second tray side walls **89** face each other in the left-right direction with a space therebetween. The rear end portions of the second tray side walls **89** are connected to the respective left and right end portions on the front surface of the vertical part **83**.

The roller support parts **87** are disposed on the top surface of the duct body **86** at the rear of the second tray part **85**. The roller support parts **87** face each other in the left-right direction with a space therebetween. The roller support parts **87** have a plate shape that is generally rectangular in a side view and extend upward from the top surface of the duct body **86**. The roller support parts **87** rotatably support the left and right ends of the discharge roller **50**. Through this configuration, the discharge roller **50** is supported in the duct unit **64**.

As will be described later, the duct unit **64** is integrally provided with a first channel **91**.

As shown in FIG. **3**, the duct unit **64** is disposed in the upper rear region of the main casing body **59** so that the front edge of the sloped part **82** in the second tray part **85** is positioned below and rearward of the rear edge of the main portion **76** in the first tray part **81**, with a gap C therebetween, and the upper edge of the vertical part **83** in the second tray part **85** confronts the bottom surface of the flat plate part **80** in the top cover **63** with a discharge opening **84** formed therebetween. The gap C is an example of the neighboring portion of the present invention. The gap C is positioned over the rear end portion of the image-forming unit **4**, as shown in FIG. **1**. Note that the left and right sides of the duct unit **64** are supported in the left wall **61** and the right wall **60**, respectively.

As shown in FIGS. **2**A and **2**B, the neighboring portions of the main portion **76** in the first tray part **81** and the sloped part **82** in the second tray part **85** define the gap C that extends in the left-right direction. In other words, the gap C extends orthogonally to the discharge direction X of the sheet P. Further, the region between the top edge of the vertical part **83** in the second tray part **85** and the bottom surface of the flat plate part **80** in the top cover **63** define the discharge opening **84**, as shown in FIG. **3**.

The second tray side walls **89** are adjacent to the corresponding first tray side walls **74** on the rear side thereof. In this way, the second tray part **85** is disposed upstream of the first tray part **81** in the discharge direction X of the sheet P. Together, the first tray part **81** and the second tray part **85** configure the discharge tray **11**.

While not shown in the drawings, the fan opening **109** confronts the through-hole **67** formed in the frame **65** in the left-right direction.

As shown in FIGS. **4** and **5**, the fan **88** is disposed inside the fan support part **68** at a position between the through-hole **67** and the vent **69** in the left-right direction. Accordingly, the fan **88** is positioned to the right of the duct body **86**.

As illustrated in FIGS. **5**, **6**, and **8**, the fan **88** when driven draws air into the duct body **86** through the through-hole **67** of the frame **65** and the fan opening **109** of the duct body **86** and exhausts air from the main casing **2** through the vent **69** and the side cover **66**. In this way, air in the main casing **2** is introduced into the duct body **86** via the ozone filters **107** and the filter openings **108**, generating a flow of air in the main casing **2** that passes through the duct body **86** and then is exhausted from the main casing **2**. In other words, the duct body **86** is configured to exhaust air from the main casing **2**.

4. Liquid Discharge Channel

As shown in FIG. **4**, the printer **1** is provided with a liquid channel **90**.

The liquid channel **90** is configured to discharge liquid from the main casing **2** that enters the main casing **2** through the gap C.

The liquid channel **90** includes a first channel **91**, a second channel **92**, and a third channel **93**.

(1) First Channel

The first channel **91** is the upstream portion of the liquid channel **90** with respect to the direction that liquid flows. The liquid channel **90** is configured to receive liquid that enters the main casing **2** through the gap C and to guide the liquid toward the frame **65**. As shown in FIG. **1**, the first channel **91** is positioned vertically between the gap C and the image-forming unit **4**.

As shown in FIGS. **7** and **8**, the first channel **91** is integrally provided in the duct unit **64**. As shown in FIG. **3**, the first

channel **91** is disposed adjacent to the duct body **86** and the second tray part **85** on the discharge direction X side thereof, and specifically on the upper front side of the duct body **86** and the front side of the second tray part **85**. The first channel **91** is also disposed beneath the rear portion of the main portion **76** constituting the sheet support part **73**. As shown in FIG. **4**, the first channel **91** is disposed to the left of the frame **65**.

As shown in FIGS. **3** and **4**, the first channel **91** is integrally provided with a recess part **95**, an extension part **96**, a protrusion **97**, and a reservoir part **98**.

The recess part **95** is provided beneath the gap C. The recess part **95** is formed as a recess that is open on the top. The recess part **95** is elongated in the left-right direction and extends toward the frame **65** as shown in FIG. **4**. As shown in FIG. **3**, the recess part **95** further includes a first recess wall **105** as an example of the first wall of the present invention, a second recess wall **106** as an example of the second wall of the present invention, and a recess bottom **104** as an example of the bottom wall of the present invention.

The first recess wall **105** constitutes the rear side of the recess part **95**. The first recess wall **105** extends continuously downward from the front end portion of the sloped part **82** in the second tray part **85**. Accordingly, the first recess wall **105** is disposed upstream of the protruding portion **77** in the discharge direction X, i.e., to the rear of the protruding portion **77**, and confronts the protruding portion **77** in the front-rear direction while being separated therefrom.

As shown in FIG. **4**, the first recess wall **105** has a plate shape that is generally trapezoidal in a front view, growing wider toward the right. Specifically, the top edge of the first recess wall **105** extends in the left-right direction, while the bottom edge of the first recess wall **105** extends in a direction sloping from the upper left to the lower right. Note that the bottom portion of the first recess wall **105** is positioned lower than the bottom edge of the protruding portion **77**.

As shown in FIG. **3**, the second recess wall **106** constitutes the front side of the recess part **95**. The second recess wall **106** is disposed downstream from the protruding portion **77** in the discharge direction X, i.e., on the front side of the protruding portion **77** while being separated therefrom. The second recess wall **106** confronts the protruding portion **77** in the front-rear direction. The second recess wall **106** has the same shape and size as the first recess wall **105** and is aligned with the first recess wall **105** in the front-rear direction.

As shown in FIG. **7**, the second recess wall **106** is formed with a communication groove **100** as an example of the communication part of the present invention. The communication groove **100** is formed in the top edge of the second recess wall **106** near the right end thereof, and specifically is provided at a position approximately one-sixth the left-right dimension of the second recess wall **106** from the right end of the same. In other words, the communication groove **100** is provided in the right portion of the recess part **95**. The communication groove **100** has a general rectangular shape in a front view and is recessed downward from the top edge of the second recess wall **106**.

As shown in FIG. **3**, the recess bottom **104** constitutes the bottom of the recess part **95** and bridges the bottom end portions of the first recess wall **105** and the second recess wall **106**. With this configuration, the recess bottom **104** is disposed beneath the protruding portion **77** and vertically confronts the protruding portion **77** with a gap therebetween. Thus, the protruding portion **77** is disposed inside the recess part **95** and protrudes toward the recess bottom **104** of the recess part **95**.

As shown in FIG. **4**, the recess bottom **104** extends in a direction sloping from the upper left toward the lower right. In other words, the recess bottom **104** is slanted downward from left to right.

Further, the left end of the recess part **95** is closed, while the right end thereof is open.

The right end of the recess part **95**, and specifically the right edges of the first recess wall **105**, the second recess wall **106**, and the recess bottom **104**, defines a liquid outlet **99**. Thus, the recess bottom **104** slopes so as to grow lower toward the liquid outlet **99**.

Further, the liquid outlet **99** is provided at the right end of the recess part **95** and is positioned further rightward than the image-forming unit **4**. The liquid outlet **99** has a general U-shape in a side view with the opening of the "U" facing upward.

The extension part **96** is disposed adjacent to the recess part **95** on the right side thereof. Specifically, as shown in FIG. **4**, the extension part **96** is offset from the image-forming unit **4** in a plan view such that the first channel **91** extends outward of the image-forming unit **4** to guide liquid outside of the image-forming unit **4**. In other word, the extension part **96** has a left end portion in communication with the liquid outlet **99** and a right end portion in left-right direction. The side cover **66** is closer to the right end portion of the extension part **96** than to the image forming unit **4** in the left-right direction. As shown in FIG. **8**, the extension part **96** has a general U-shape in a side view with the opening of the "U" facing upward. The extension part **96** extends continuously rightward from the right end of the recess part **95**.

As shown in FIG. **4**, the extension part **96** has an extension part bottom wall **103** that constitutes the bottom of the extension part **96**. The extension part bottom wall **103** extends continuously downward and rightward from the right edge of the recess bottom **104** constituting the recess part **95** and follows the same slope as the recess bottom **104**. Accordingly, the top surface of the extension part bottom wall **103** is substantially flush with the top surface of the recess bottom **104**.

The interior space of the extension part **96** is in communication with the liquid outlet **99** in the left-right direction and communicates with the interior space of the recess part **95** through the liquid outlet **99**.

As shown in FIG. **8**, the protrusion **97** protrudes continuously downward from the right edge of the extension part bottom wall **103**. The protrusion **97** is plate-like with a general trapezoidal shape in a side view, growing narrower toward the bottom.

The reservoir part **98** is disposed adjacent to the recess part **95** on the front side thereof. As shown in FIG. **3**, the reservoir part **98** has a box-like shape that is open on the top. The top end portion on the rear wall of the reservoir part **98** is connected to the front end portion on the bottom surface of the recess bottom **104**.

The front wall of the reservoir part **98** has a greater vertical dimension than the rear wall of the reservoir part **98**. Hence, the front wall of the reservoir part **98** has an upper portion positioned to the front of and spaced apart from the second recess wall **106** so as to oppose the second recess wall **106** in the front-rear direction. Accordingly, as shown in FIG. **7**, the front surface of the second recess wall **106** faces the interior space of the reservoir part **98**, and the communication groove **100** allows communication in the front-rear direction between the interior space of the recess part **95** and the interior space of the reservoir part **98**.

As shown in FIG. **8**, the reservoir part **98** includes a first reservoir part **101**, and a second reservoir part **102**.

The first reservoir part **101** constitutes the right portion of the reservoir part **98**. The first reservoir part **101** is in communication with the interior space of the recess part **95** through the communication groove **100**.

The second reservoir part **102** constitutes the left portion of the reservoir part **98** and is adjacent to the first reservoir part **101** on the left side thereof. The second reservoir part **102** is in communication with the first reservoir part **101** in the left-right direction. The second reservoir part **102** has a greater vertical dimension than the first reservoir part **101**.

(2) Second Channel

As shown in FIG. **4**, the second channel **92** constitutes the middle portion of the liquid channel **90** along the direction that liquid flows. The second channel **92** is configured to receive liquid from the first channel **91** and to guide the received liquid toward the third channel **93**.

As shown in FIGS. **4** and **5**, the second channel **92** is formed in the frame **65**. The second channel **92** includes an inlet **110**, a liquid receiving part **111** and a guiding part **112**.

As shown in FIG. **5**, the inlet **110** as an example of the passage opening of the present invention is provided on the front side of the through-hole **67**. The inlet **110** has a general rectangular shape in a side view and passes through the frame **65** in the left-right direction.

As shown in FIG. **4**, the liquid receiving part **111** is provided on the left surface of the frame **65** at a position below the protrusion **97**. The liquid receiving part **111** protrudes leftward from the bottom peripheral edge of the inlet **110** toward the liquid outlet **99**. More specifically, the liquid receiving part **111** is integrally provided with a receiving wall **113**, and a pair of coupling walls **114**.

The receiving wall **113** constitutes the bottom of the liquid receiving part **111**. The receiving wall **113** has a plate shape that is generally L-shaped in a side view. Specifically, the receiving wall **113** first extends leftward from the bottom edge of the inlet **110**, then bends and extends upward.

The coupling walls **114** constitute the front and rear sides of the liquid receiving part **111** and are disposed apart from each other in the front-rear direction. The coupling walls **114** are plate-shaped and have a general rectangular shape in a front view. The inner front-rear surfaces of the coupling walls **114** at their bottom and left edges are respectively connected to the front and rear edges of the receiving wall **113**. The right edges of the coupling walls **114** are connected to peripheral edges of the inlet **110**.

Through this configuration, the bottom portion of the inlet **110** and the liquid receiving part **111** are in communication with each other in the left-right direction.

As shown in FIG. **5**, the guiding part **112** is disposed on the right surface of the frame **65** and is adjacent to the front side of the fan support part **68**. The right surface of the frame **65** is an example of the cover-side surface of the present invention. Specifically, the guiding part **112** is disposed between the side cover **66** and the first channel **91** in the left-right direction. The guiding part **112** includes a pair of first guiding walls **117**, and a closing wall **118** as an example of the closing part in the present invention.

One of the first guiding walls **117** is disposed on each of the front and rear sides of the inlet **110** so that the inlet **110** is interposed therebetween when viewed from the right. The first guiding walls **117** protrude rightward from the right surface of the frame **65** and are separated from each other in the front-rear direction. The first guiding walls **117** include a front first guiding wall **117**F and a rear first guiding wall **117**R.

The front first guiding wall **117**F is integrally provided with a straight portion **119**, and a sloped portion **120**.

In a side view, the straight portion **119** extends linearly along the vertical direction. The straight portion **119** has a top end portion positioned on the right of the inlet **110**.

The sloped portion **120** is formed continuously with the bottom edge of the straight portion **119** and slopes rearward toward the bottom. While not shown in the drawings, a power supply board is provided on the right surface of the frame **65** in front of the front first guiding wall **117**F for supplying power to the image-forming unit **4**. Hence, the sloped portion **120** slopes away from the power supply board.

The rear first guiding wall **117**R constitutes the front wall of the fan support part **68**, as described above, and extends linearly along the vertical in a side view. The top end portion of the rear first guiding wall **117**R is positioned on the rear side of the inlet **110** in a side view. The vertical dimension of the rear first guiding wall **117**R is approximately equivalent to the vertical dimension of the straight portion **119**.

The closing wall **118** is disposed adjacent to the bottoms of the first guiding walls **117**. That is, the closing wall **118** is positioned lower than the fan support part **68** and, hence, is positioned lower than the fan **88**.

The closing wall **118** has a general U-shape in a side view, with the opening of the "U" facing upward. The closing wall **118** protrudes rightward from the right surface of the frame **65**.

As shown in FIG. **4**, the closing wall **118** has a greater left-right dimension than the left-right dimension of the first guiding walls **117**. The right portion of the closing wall **118** protrudes farther rightward than the first guiding walls **117**.

As shown in FIG. **5**, the left portion of the front wall of the closing wall **118** is connected at its top end portion to the bottom end portion of the sloped portion **120** constituting the front first guiding wall **117**F, and the left portion of the rear wall of the closing wall **118** is connected at its top end portion to the bottom end portion of the rear first guiding wall **117**R. Through this configuration, the closing wall **118** is coupled to the bottom end portions of both first guiding walls **117**.

(3) Third Channel

As shown in FIGS. **4** and **6**, the third channel **93** constitutes the downstream portion of the liquid channel **90** in the direction that liquid flows therethrough. The third channel **93** is configured to receive liquid from the second channel **92** and to guide the liquid out of the main casing **2** through the notched groove **70**.

As shown in FIG. **6**, the third channel **93** is integrally provided on the side cover **66**, and specifically on the left surface of the side cover **66**. The third channel **93** includes a rib **130** as an example of the protruding part in the present invention, and a pair of second guiding walls **131**.

The rib **130** is disposed on the left surface of the side cover **66** at a position on the lower front side of the vent **69**. The rib **130** extends linearly along the vertical in a side view and has a general plate shape that protrudes leftward from the left surface of the side cover **66**. The left end of the rib **130** and the right end on the bottom edge of the closing wall **118** face each other in the left-right direction with a slight gap therebetween.

The second guiding walls **131** are respectively arranged on each of the front and rear sides of the rib **130** so that the rib **130** is interposed between the second guiding walls **131** in a left side view. The second guiding walls **131** protrude leftward from the left surface of the side cover **66** and are separated from each other in the front-rear direction.

More specifically, the rib **130** is disposed between the upper end portions of the second guiding walls **131**, with the upper end portions of the second guiding walls **131** aligned with the upper end of the rib **130** in the front-rear direction with gaps therebetween.

The bottom portions of the second guiding walls **131** slope rearward toward the bottom, such that the bottom ends of the second guiding walls **131** are positioned above the notched groove **70** with a space therebetween.

5. Liquid-Guiding Function

As illustrated by the printer **1** in FIGS. **2**A, **2**B, and **3**, if the user accidentally spills water or other liquid over the top of the main casing **2**, the liquid lands on the top surface of the top wall **71** constituting the main casing **2**.

If this occurs, liquid may enter the gap C formed between the main portion **76** of the sheet support part **73** and the sloped part **82** of the second tray part **85** shown in FIG. **3**. Liquid that enters the gap C flows down along the protruding portion **77** and drops from the bottom end of the protruding portion **77** onto the top surface of the recess bottom **104** constituting the recess part **95**.

As shown in FIG. **4**, liquid falling onto the recess bottom **104** flows rightward along the sloped recess bottom **104**. In other words, the recess part **95** receives liquid that penetrates the main casing **2** through the gap C and guides that liquid rightward.

Once the liquid reaches the right end of the recess part **95**, the liquid is discharged from the recess part **95** through the liquid outlet **99**. If the flow of liquid in the recess part **95** increases until the surface of the liquid rises above the bottom edge of the communication groove **100** at this time, some of the liquid flows through the communication groove **100** into the first reservoir part **101** of the reservoir part **98** and is retained therein, as shown in FIG. **7**.

Further, liquid discharged from the recess part **95** through the liquid outlet **99** enters the extension part **96** that communicates with the liquid outlet **99** and flows along the top surface of the extension part bottom wall **103** constituting the extension part **96** that slopes diagonally downward and rightward. Subsequently, the liquid flows over the right edge of the extension part **96** down along the protrusion **97** and falls onto the liquid receiving part **111** of the second channel **92**.

The receiving wall **113** of the liquid receiving part **111** receives liquid flowing down from the protrusion **97**. The liquid receiving part **111** guides the liquid to flow rightward toward the inlet **110**.

The liquid passes through the inlet **110** from left to right. With this configuration, the liquid receiving part **111** and the inlet **110** guide liquid transferred through the first channel **91** to the side of the frame **65** opposite the image-forming unit **4**.

As shown in FIG. **5**, liquid passing through the inlet **110** is guided by the pair of first guiding walls **117** to flow downward along the right surface of the frame **65** in the flow direction Y. When the liquid reaches the closing wall **118** constituting the bottom end of the guiding part **112**, the liquid flows along the bottom wall of the closing wall **118**, changing the direction of flow from the flow direction Y to the right. Hence, the closing wall **118** is disposed on the downstream ends of the first guiding walls **117** in the flow direction Y and is coupled to these downstream ends.

As shown in FIG. **6**, when the liquid subsequently reaches the right end of the closing wall **118**, the liquid is transferred from the closing wall **118** to the rib **130**. The liquid flows down along the rib **130** and is guided by the pair of second guiding walls **131** to flow downward along the left surface of the side cover **66**.

Next, the liquid is discharged from the bottom edges of the second guiding walls **131**, flows downward toward the notched groove **70** and is discharged from the main casing **2** through the notched groove **70**.

6. Operational Advantages

(1) As shown in FIG. **3**, the first channel **91** in the printer **1** has the recess part **95** disposed below the gap C formed between neighboring portions of the first tray part **81** and the second tray part **85**. Hence, liquid applied to the top of the top wall **71** constituting the main casing **2** is received by the recess part **95** if the liquid enters the main casing body **59** through the gap C. As illustrated in FIG. **4**, the recess part **95** can guide the liquid toward the frame **65**. As shown in FIG. **4**, after liquid is guided by the recess part **95** toward the frame **65**, the liquid is discharged toward the frame **65** through the liquid outlet **99**. Liquid discharged from the liquid outlet **99** passes from left to right through the inlet **110** toward the frame **65** and is received in the second channel **92** provided in the frame **65**.

That is, liquid that enters the main casing body **59** through the gap C is first received in the recess part **95**. After flowing toward the frame **65** through the recess part **95**, the liquid is guided to the opposite side of the image-forming unit **4** with respect to the frame **65** through the inlet **110** and is then transferred to the second channel **92**.

Accordingly, the structure of the invention can reliably prevent the image-forming unit **4** and the like from becoming wet, even if liquid enters the main casing body **59** through the gap C.

(2) As shown in FIG. **6**, the side cover **66** provided adjacent to the frame **65** on the right side thereof is provided with the third channel **93**. Hence, liquid guided into the second channel **92** is subsequently transferred to the third channel **93** after being guided to the opposite side of the image-forming unit **4** with respect to the frame **65** through the inlet **110**, as shown in FIGS. **5** and **6**. The third channel **93** then guides liquid received from the second channel **92** to the outside of the main casing body **59**.

As a result, liquid penetrating the main casing body **59** through the gap C can be discharged from the main casing body **59** through the first channel **91**, the second channel **92**, and the third channel **93**. Accordingly, this structure can reliably prevent the image-forming unit **4** and the like from becoming wet.

(3) As shown in FIG. **4**, the extension part **96** guides liquid discharged through the liquid outlet **99** rightward, i.e., toward the frame **65**. In this way, liquid discharged from the liquid outlet **99** can be reliably received in the second channel **92** provided in the frame **65**.

(4) As shown in FIG. **4**, the liquid outlet **99** is provided on the right end portion of the recess part **95** and is positioned farther rightward than the image-forming unit **4**. Accordingly, liquid received in the recess part **95** is guided in the recess part **95** to a position that is offset from the image-forming unit **4** in a plan view and is then subsequently discharged from the recess part **95** through the liquid outlet **99**.

Accordingly, the structure of the invention can reliably prevent the image-forming unit **4** from becoming wet by liquid discharged through the liquid outlet **99**.

(5) As shown in FIG. **4**, liquid discharged through the liquid outlet **99** flows along the extension part **96** and subsequently drops off the extension part **96** and flows down along the protrusion **97**. Thus, liquid discharged through the liquid outlet **99** can be guided reliably toward the second channel **92**.

(6) As shown in FIG. **4**, the liquid receiving part **111** is provided beneath the protrusion **97**. The liquid receiving part **111** can reliably receive liquid flowing down along the pro-

trusion **97**. Since the liquid receiving part **111** is in communication with the inlet **110**, liquid received by the liquid receiving part **111** can be reliably guided toward the inlet **110**.

(7) As shown in FIG. **5**, the second channel **92** has the pair of first guiding walls **117**. The first guiding walls **117** guide liquid passing through the inlet **110** along the right surface of the frame **65** to a prescribed position. The closing wall **118** coupled to the downstream end portions of the first guiding walls **117** in the flow direction Y subsequently changes the direction of flow to transfer the liquid to the third channel **93**.

Accordingly, this construction can reliably guide liquid along the right surface of the frame **65** after the liquid has passed through the inlet **110** and can reliably transfer liquid from the guiding part **112** to the third channel **93**.

(8) As shown in FIG. **6**, the rib **130** confronts the guiding part **112** in the left-right direction. With this configuration, liquid guided through the guiding part **112** is transferred from the guiding part **112** to the third channel **93** along the rib **130**. Subsequently, the pair of second guiding walls **131** guide the liquid along the left surface of the side cover **66** toward the outside of the main casing body **59**.

As a result, this construction can stably transfer liquid from the guiding part **112** to the third channel **93** and can reliably guide that liquid out of the main casing body **59**.

(9) As shown in FIG. **6**, the rib **130** is adjacent to the right edge of the closing wall **118** on the right side thereof. Thus, after the closing wall **118** changes the direction in which liquid flows, the liquid can be stably transferred along the rib **130** from the guiding part **112** to the third channel **93**. Accordingly, this construction can transfer liquid from the guiding part **112** to the third channel **93** with reliability.

(10) As shown in FIG. **3**, the printer **1** is provided with the duct body **86** and the fan **88**. By driving the fan **88**, air in the main casing body **59** can be exhausted from the main casing body **59** through the duct body **86**. In this way, heat can be efficiently dissipated from the printer **1**.

Since the duct unit **64** is integrally provided with the duct body **86** and the first channel **91**, fewer parts are required in this structure in comparison with a case where the duct body **86** and the first channel **91** were provided separately.

(11) As shown in FIG. **5**, the closing wall **118** is provided lower than the fan **88**. This configuration suppresses any influence that the flow of air driven by the fan **88** affects liquid when the closing wall **118** changes the flow direction F. As a result, liquid can be more stably transferred from the closing wall **118** to the third channel **93**.

(12) As shown in FIG. **3**, the printer **1** is provided with the duct body **86** and the fan **88**. Since the duct unit **64** is integrally provided with the duct body **86** and the first channel **91**, fewer parts are required in this structure in comparison with a case where the duct body **86** and the first channel **91** were provided separately.

(13) As shown in FIG. **3**, the discharge tray **11** that supports sheets P after the sheets P have been discharged from the sheet-discharge unit **5** is supported on the main casing body **59** above the image-forming unit **4**. This arrangement provides easy access to sheets P discharged from the sheet-discharge unit **5**.

Further, the first tray part **81** constituting part of the discharge tray **11** can be removed from the main casing body **59**. Accordingly, maintenance on the image-forming unit **4** is facilitated simply by removing the first tray part **81** from the main casing body **59**.

(14) As shown in FIG. **3**, the recess part **95** has the recess bottom **104** constituting the bottom of the recess part **95**. Liquid that enters the main casing body **59** through the gap C is received on the recess bottom **104** and flows along the recess bottom **104**, as indicated in FIG. **4**. Here, the recess bottom **104** is sloped downward toward the liquid outlet **99**. Accordingly, the recess bottom **104** can reliably guide liquid received on the recess part **95** toward the liquid outlet **99** and can reliably discharge liquid from the recess part **95** through the liquid outlet **99**.

(15) As shown in FIG. **3**, the first tray part **81** has the protruding portion **77** that protrudes toward and into the recess part **95**. Accordingly, liquid that enters the main casing body **59** through the gap C flows along the protruding portion **77** before dropping onto the recess bottom **104** of the recess part **95**.

(16) As shown in FIG. **7**, the duct unit **64** is integrally provided with the first channel **91** and the second tray part **85**. Thus, fewer parts are required in this structure than if the first channel **91** and second tray part **85** were provided separately.

(17) As shown in FIG. **2**A, the discharge tray **11** in the printer **1** is configured from the first tray part **81** and the second tray part **85**. Consequently, the gap C is formed between the neighboring portions of the first tray part **81** and the second tray part **85**. Hence, liquid applied to the top of the discharge tray **11** may enter the main casing body **59** through the gap C.

However, since the recess part **95** of the first channel **91** is disposed beneath the gap C, as shown in FIG. **3**, the recess part **95** receives liquid that enters the main casing body **59** through the gap C. As illustrated in FIG. **4**, the recess part **95** can guide liquid received therein rightward to the prescribed position, after which liquid is discharged from the recess part **95** through the liquid outlet **99**.

If the flow of liquid entering the main casing body **59** increases, causing the level of the liquid flowing in the recess part **95** to increase, the surface of the liquid flowing in the recess part **95** may rise above the bottom edge of the communication groove **100** shown in FIG. **7**. If this occurs, some of the liquid flows through the communication groove **100** and is collected in the first reservoir part **101** of the reservoir part **98**.

Thus, liquid entering the main casing body **59** through the gap C is received by the recess part **95** and then discharged through the liquid outlet **99** at a prescribed position. Even if the flow of liquid in the recess part **95** increases, the liquid passes through the communication groove **100** and is collected in the reservoir part **98**. Thus, this configuration reliably prevents the image-forming unit **4** and the like from becoming wet.

(18) As shown in FIG. **7**, the communication groove **100** is provided in the right side of the recess part **95**. Hence, both the communication groove **100** and the liquid outlet **99** are provided on the right portion of the recess part **95**. Therefore, by guiding liquid toward the right, the recess part **95** can discharge the liquid through the liquid outlet **99** and can collect excess liquid in the reservoir part **98** through the communication groove **100**. Thus, this construction can reliably discharge and collect liquid that enters the main casing body **59**.

The recess part **95** also has the first recess wall **105** and the second recess wall **106** each disposed on opposite sides of the protruding portion **77** with respect to the discharge direction X. Accordingly, the recess part **95** can reliably receive liquid that flows down the protruding portion **77** into the recess part **95**.

(19) As shown in FIG. **8**, the reservoir part **98** has the first reservoir part **101** and second reservoir part **102**. This structure increases the quantity of liquid that the reservoir part **98** can collect.

(20) As shown in FIG. **3**, the printer **1** includes the duct body **86** and the fan **88**. By driving the fan **88**, air in the main

casing **2** can be exhausted from the main casing **2** through the duct body **86**. In this way, heat can be efficiently dissipated from the printer **1**.

Further, the first reservoir part **101** provided relatively near the fan **88** has a smaller vertical dimension than the second reservoir part **102**. This allows the reservoir part **98** to be provided with both the first reservoir part **101** and the second reservoir part **102**, while ensuring a smooth flow of air near the fan **88**. Thus, heat can be efficiently dissipated from the printer **1** while increasing the quantity of liquid that the reservoir part **98** can retain.

What is claimed is:

1. An image forming apparatus comprising:

a casing comprising a frame supporting an image forming unit configured to form an image on a recording medium; and

a cover unit disposed above the image forming unit and comprising a first member, a second member positioned adjacent thereto, and a neighboring portion positioned between the first member and the second member and over the image forming unit; and

a liquid channel configured to guide liquid that has entered the casing and comprising:

a first channel disposed between the neighboring portion and the image forming unit and configured to receive liquid that has entered the casing through the neighboring portion and guide the liquid to the frame, the first channel comprising:

a recess part disposed below the neighboring portion and extending toward the frame in an extending direction; and

a liquid outlet configured to discharge the liquid from the recess part and positioned at an end portion of the recess part in the extending direction; and

a second channel disposed at the frame and configured to receive the liquid from the first channel, the second channel having a passage opening through the frame in the extending direction and configured to allow the liquid discharged from the liquid outlet to pass through the frame in the extending direction.

2. The image forming apparatus according to claim **1**, further comprising a cover disposed adjacent to the frame and covering the frame from an opposite side of the image forming unit with respect to the frame in the extending direction,

wherein the liquid channel further comprises a third channel configured to receive the liquid from the second channel and guide the liquid outside the casing, the third channel being provided at the cover.

3. The image forming apparatus according to claim **1**, further comprising a cover disposed adjacent to the frame and covering the frame from an opposite side of the image forming unit with respect to the frame in the extending direction,

wherein the first channel comprises an extension part extending from the liquid outlet toward the cover and in communication with the liquid outlet.

4. The image forming apparatus according to claim **3**, wherein the extension part has one end portion in communication with the liquid outlet and another end portion opposite to the one end portion in the extending direction,

wherein the cover is closer to the another end portion of the extension part than to the image forming unit in the extending direction.

5. The image forming apparatus according to claim **3**, wherein the extension part has a bottom end portion,

wherein the first channel comprises a protrusion protruding downward from the bottom end portion of the extension part.

6. The image forming apparatus according to claim **5**, wherein the second channel comprises a receiving part extending toward the liquid outlet in the extending direction, the receiving part being disposed under the protrusion and in communication with the second channel.

7. The image forming apparatus according to claim **3**, wherein the frame has a cover-side surface facing the cover,

wherein the second channel comprises a guiding part disposed on the cover-side surface of the frame, the guiding part comprising:

a pair of first guiding walls disposed at both sides of the passage opening as viewed from the extending direction so as to sandwich the passage opening, each of the first guiding walls having a downstream end portion in a flow direction of the liquid; and

a closing part disposed at the downstream end portion of the pair of first guiding walls and connecting the downstream end portions of the first guiding walls with each other.

8. The image forming apparatus according claim **7**, wherein the liquid channel further comprises a third channel configured to receive the liquid from the second channel and guide the liquid outside the casing, the third channel being provided at the cover,

wherein the third channel comprises:

a protruding part facing the guiding part in the extending direction and protruding from the cover in the extending direction; and

a pair of second guiding walls disposed at both sides of the protruding part as viewed from the extending direction so as to sandwich the protruding part.

9. The image forming apparatus according to claim **8**, wherein the protruding part is disposed adjacent to the closing part in the extending direction.

10. The image forming apparatus according to claim **8**, further comprising:

a duct configured to discharge air from the casing to an outside of the casing; and

a fan configured to cause the air in the duct to flow, the duct and the first channel being integrally formed with each other.

11. The image forming apparatus according to claim **10**, wherein the fan faces the cover in the extending direction, and the closing part is positioned lower than the fan.

12. The image forming apparatus according to claim **1**, further comprising:

a duct configured to discharge air from the casing to an outside of the casing; and

a fan configured to cause the air in the duct to flow, the duct and the first channel being integrally formed with each other.

13. The image forming apparatus according to claim **1**, further comprising:

a discharge unit configured to discharge the recording medium on which the image has been formed by the image forming unit to an outside of the casing in a discharge direction perpendicular to a vertical direction and the extending direction; and

a tray unit comprising the first member and the second member and configured to support the recording medium discharged from the discharge unit,

wherein the first member is disposed downstream of the second member in the discharge direction,

wherein the neighboring portion is a gap extending in the extending direction.

14. The image forming apparatus according to claim 13, wherein the recess part has a bottom end portion provided with a bottom wall,

wherein the bottom wall is sloped downward toward the liquid outlet.

15. The image forming apparatus according to claim 14, wherein the first member comprises a protruding portion extending in the extending direction and disposed in the recess part, the protruding portion protruding toward the bottom wall,

wherein the recess part comprises:

a first wall disposed at an upstream side of the protruding portion in the discharge direction so as to face the protruding portion with a gap between the protruding portion and the first wall; and

a second wall disposed at a downstream side of the protruding portion in the discharge direction so as to face the protruding portion with a gap between the protruding portion and the second wall.

16. The image forming apparatus according to claim 15, wherein the recess part and the second member are integrally formed with each other.

17. The image forming apparatus according to claim 13, further comprising:

a reservoir part configured to accommodate therein liquid and disposed adjacent to the recess part; and

a communication part providing a communication between the recess part and the reservoir part.

18. The image forming apparatus according to claim 17, wherein the recess part has another end portion opposite to the end portion in the extending direction,

wherein the communication part is disposed closer to the end portion than to the another end portion.

19. The image forming apparatus according to claim 17, wherein the reservoir part comprises:

a first reservoir part in communication with the communication part; and

a second reservoir part in communication with the first reservoir part and disposed adjacent to the first reservoir part at an opposite side of the liquid outlet with respect to the first reservoir part in the extending direction,

wherein the first reservoir part has a vertical length in the vertical direction smaller than a vertical length in the vertical direction of the second reservoir part.

20. The image forming apparatus according to claim 19, further comprising:

a duct configured to discharge air from the casing to an outside of the casing, the duct being disposed adjacent to the recess part in the discharge direction; and

a fan configured to cause the air in the duct to flow, the fan being disposed at a side opposite to the image forming unit with respect to the frame in the extending direction.

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